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January 1958

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Calendar

Cooperation of Society Secretaries in supplying meeting notices for GEOTIMES calendar is requested.

Feb. 16-20, 1958—AIME, ANNUAL MEETING, Hotel Statler, New York City. SEcG technical meetings held in conjunction.

March 3-4, 1958—AIME, SOC. PETROLEUM ENGINEERS, Fourth Annual joint meeting, Rocky Mt. Petroleum Sections, Cosmopolitan Hotel, Denver, Colo.

Mar. 7-8, 1958—AAPG: Pacific Section Ann. Mtg., Ambassador Hotel, Los Angeles, Calif.

Mar. 10-13, 1958—AAPG-SEPM ANNUAL MEETING, Biltmore Hotel, Los Angeles, Calif.

Mar. 20-21, 1958—AIME: MID-CONTINENT LOCAL SEC; Petroleum Production & Reservoir Engineering Conf., Mayo Hotel, Tulsa, Okla.

March 23-29, 1958—ACSM-ASP: Consecutive Meetings and Co-Exhibit, Shoreham Hotel, Washington, D. C.

March 27-29, 1958—OPTICAL SOCIETY OF AMERICA, Spring meeting, Sheraton-Park Hotel, Washington, D. C.

Mar. 27-28, 1958—SEPM, (PERMIAN BASIN SECT.) Ann. Tech. Mtg. Registration and sessions at Hotel Scharbauer, Midland, Tex. J. P. D. Hull, Jr., Chrmn. Loc. Comm.

Mar. 27-29, 1958—AIME: PACIFIC SOUTHWEST CONF.; St. Francis Hotel, San Francisco

Mar. 28-29, 1958—GSA, CORDILLERAN SECT., Annual Meeting, Eugene, Ore. Field trip on March 27.

April 17-18, 1958—SEGp, 11th Annual Midwestern Meeting, Mayo Hotel, Tulsa, Okla.

April 17-18, 1958—AIME, SOC. PETROLEUM ENGINEERS, Gas Technology Symposium, Lou.-Ark., Miss. & East Texas Sections, Shreveport, La.

April 17-19, 1958—SIGMA GAMMA EPSILON, 19th Biennial Convention, Pittsburgh, Pa.

April 17-19, 1958—AIME: PACIFIC NORTHWEST REGIONAL CONF., Spokane, Wash.

April 23-25, 1958—SECOND INTERNATIONAL WILLISTON BASIN SYMPOSIUM, sponsored by Sask. Geol. Soc. & N. D. Geol. Soc., Provincial Museum Bldg., Bismarck, N. D.

Apr. 27-30, 1958—AAPG, ROCKY MTN. SECTION, 8th Ann. Conv., Industrial Bldg., Natrona County Fairgrounds, Casper, Wyoming.

May 1-3, 1958—GSA, SOUTHEASTERN SECTION, Co-sponsors are Ala. Geol. Surv. and Dept. of Geol., Univ. of Ala.; Theme: Economic Geology of the Southeastern U. S. in relation to future world events. Tuscaloosa, Ala.

May 5-6, 1958—AIME, SOC. PETROLEUM ENGINEERS, Third Biennial Secondary Recovery Symposium, Wichita Falls, Texas.

May 5-7, 1958—AGU, Thirty-Ninth Ann. Mtg., Nat. Acad. Sci., Washington, D. C.

May 9-11, 1958—AIME: URANIUM SECT., 3rd Annual Uranium Symposium, Moab, Utah.

May 17-18, 1958—FRIENDS OF THE PLEISTOCENE; for information write: Wilson M. Laird, Univ. of North Dakota, Grand Forks, N. D.

July 4-7, 1958—SWEDISH GEOLOGICAL SURVEY, 100th Jubilee Meetings, Stockholm, Sweden. Excursions before and after meetings.

Aug. 26-28, 1958—SYMPOSIUM ON PROBLEMS OF THE LAHONTAN BASIN, spons. by Sigma Xi Club of Univ. of Nevada, on campus, Reno, Nevada.

Sept. 2-4, 1958—SVP: Annual Meeting with SSE, University of Michigan, Ann Arbor, Mich.

Sept. 10-12, 1958—AIME: SOC. OF MINING ENGRS., Rocky Mountain Mins. Conf., Salt Lake City.

Oct. 5-8, 1958—AIME: SOC. PETR. ENG., Fall Meeting, Houston, Texas.

Oct. 9-11, 1958—OPTICAL SOC. OF AMER., Ann. Mtg., Statler Hotel, Detroit, Michigan.

Oct. 13-16, 1958—SEGp: 28th Ann. Meeting, Gunter Hotel & Municipal Auditorium, San Antonio, Texas.

Oct. 16-17, 1958—AIME: Southern California Petroleum Sect. Fall Meeting, Biltmore Hotel, Los Angeles.

Oct. 23-25, 1958—AIME: Mid-America Minerals Conference, St. Louis.

Nov. 6-8, 1958—GSA: ANNUAL MEETING, St. Louis, Mo., SEcG Ann. Mtg. in conjunction.

XXI I.G.C., Copenhagen

General Secretary Theodor Sorgenfrei of the XXI International Geological Congress has announced that the sessions of the Congress will be held in Copenhagen, Denmark, August 15 to 25, 1960. Excursions to all Scandinavian countries and to Greenland are planned. The pre-Congress trips are tentatively planned for August 11 to 14 and post-Congress trips, August 26 to September 10. The first circular will be issued early in 1958.

UNESCO OPENINGS

Under its Technical Assistance Program, UNESCO has announced several vacancies, two of which are of special interest to geological scientists. These are both for positions in Egypt, as outlined below:

EGYS 3: Specialist in Hydrogeology, Desert Institute, Mataria, near Cairo, Egypt. Capable of directing, organizing and undertaking groundwater surveys and research in deserts. Language: English or French. $7,300.

EGYS 14: Expert in Geophysics, Desert Institute, Heliopolis (near Cairo), Egypt. To evaluate geophysical information; to plan, advise and organize research programme. Language: English or French. $6,000-$7,300.

General qualifications are that the applicant have a Ph.D. degree and substantial experience in the field of specialization and necessary language proficiencies. Allowances are made for travel expenses and certain family allowances are offered.

Persons interested in further information may write to Mr. Arthur Gagliotti, Assistant Representative of UNESCO to the United Nations, United Nations—Room 2201, New York 17, New York.

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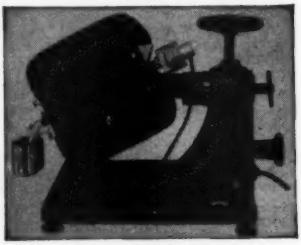

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AGI PUBLICATIONS

AGI REPORT 12, *1956 Edition*, "SURVEY OF GEOLOGY-GEOPHYSICS STUDENTS IN THE COLLEGES AND UNIVERSITIES OF THE U. S. IN 1955-56 AND OF AVAILABLE SCHOLARSHIPS, FELLOWSHIPS, ASSISTANTSHIPS, ETC." *1956, $0.50.*

A detailed listing of geology and geophysics graduates by school, together with generalized data on available financial aids.

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AGI REPORT 12, *1957 Edition*, "SURVEY OF GEOLOGY-GEOPHYSICS STUDENTS IN THE COLLEGES AND UNIVERSITIES OF THE U. S. AND CANADA IN 1956-57," *$0.50.*

Contains detailed information on 1957 student survey, but does not contain scholarship-fellowship data listed in the 1956 report above.

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This Month in GEOTIMES

Professional News Magazine
Published by THE AMERICAN GEOLOGICAL INSTITUTE

Robert C. Stephenson, EDITOR
Kathryn Lohman, CIRCULATION MANAGER

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Research for Living

Thinking people can find serious food for thought in a recent report of the National Science Foundation on Federal Government expenditures for research and development. The Foundation showed that in 1957 only 8 cents of each of the R & D dollars spent went into basic research, while 60 cents went for development. Furthermore, two agencies, the Department of Defense and the Atomic Energy Commission, accounted for 85 per cent of the $3 billion spent. Very little of the defense budget was allocated to basic research.

Against this background of rather staggering research and development expenditures for defense programs in 1957, we now find ourselves facing prospects of accelerated expenditures in these areas. Indications are that the Administration and Congress will go all out for R & D spending on missiles, satellites and attendant defense spending.

We can find several reasons for concern. The eight per cent for basic research is a mighty small segment of the total funds reported spent for research and development. The prospects are that the R & D funds for defense will be increased sharply, but such expenditures will be offset by economies elsewhere in government which will cut sharply into research and development funds of agencies that traditionally conduct basic research. The U. S. Geological Survey for one could be caught in this squeeze.

We cannot deny the need for stepped-up defense efforts which may be presumed to cost more money. We do question the curtailment of research on the basic problems of *living* which confront our nation. With a growing population and an advancing civilization, we cannot side-step problems of resources—plant, animal, mineral, and *human*.

Two things are needed: (1) an increase in the proportion of basic research to total R & D expenditures, and (2) the uniform advancement of basic research on all scientific frontiers. New basic knowledge can provide the foundation for new advances to meet problems of *living* as well as problems of defense.

OUR COVER

Field geologist and insect assistant are intently studying a rock specimen. Photo by courtesy of Standard Oil Co. (N. J.)

The AMERICAN GEOLOGICAL INSTITUTE is a non-profit professional service organization established and managed by the scientific societies in the fields of geology and geophysics in cooperation with the National Academy of Sciences-National Research Council. It is the instrument of the profession serving and advancing the welfare of the geoscientist in matters relating to education, professional responsibilities and government relations. It is an active member of the Scientific Manpower Commission. It also functions in the stimulation of public education and awareness of the earth sciences, through career literature, the scouting program and other channels of communication.

GEOTIMES is the news magazine of the geological sciences. It reports on current events in the earth sciences, public education and public relations efforts throughout the profession, as well as appropriate legislative and governmental issues. It announces scholarships, fellowships, publications and new developments. It provides a forum for discussion of timely professional problems, and affords a common bond between the many specialized groups within the earth sciences.

MARTIAN FEATURES

Have considerable similarity to geologic patterns on Earth

by HORST VON BANDAT

The recent biannual proximity of Mars turned interest of astronomers and the public as well toward the "red-green" planet. Color photographs, taken by W. S. Finsen in South Africa, were published in September last year, showing the color pattern of Mars for the first time with more clarity and a rather good color rendition.

This color pattern has a dominant reddish tint. There are dark markings ranging from gray to black, while the lighter ones range from cream to flesh color to orange-red and red. Shades of green and bluish gray obliterate large areas but seem not to be permanent. The colored spots have no sharp outlines, but change gradually and appear to overlap each other (Fig. 1).

The color pattern and the polar caps indicate the presence of water and plant life on Mars. Recent studies made by W. Sinton of the Smithsonian Institution, and H. Strughold (USAF) confirm these suppositions.

Besides the colored areas of Mars, there are features visible called "canals." These are broad dark stripes and very fine thin lines that enmesh the entire Mars surface and have at their intersections dark roundish spots. They are so thin and fine that they are difficult to photograph, but in 1954 Dr. Petit of Pasadena succeeded in doing so for the first time. In June 1956 R. S. Richardson saw them in the 60-inch Mt. Wilson reflector (*Astron. Pub. Soc. Pac., 69, 57*) as a multitude of blue canals in the light desert areas of the Southern Hemisphere, but again they were too fine to be photographed. A. Webb (*Scientific Monthly, 85, 1,* July 1957) in his article on the canal theory, describes his observations at the Lowell Observatory in 1954 through a 24-inch reflector—"They were very unsteady, vanished and reappeared and were black in color."

It seems that there are two types of "canals" on Mars. Broad dark bands 500 km or more wide are observed mainly on the Southern Hemisphere, in areas such as Cimmerium, Lake of Sun, and Electris. There are *linear contacts with the light areas,* the dark "fillings" showing *seasonal changes.* There are others, which are fine, thread-like, possibly only a few kilometers wide, but thousands of kilometers long. Both types have at their intersections dark, roundish spots called "oases" which vary from a few to 500 or more kilometers in diameter. This type of land form, having no counterpart in terrestrial forms, has caused Webb (*loc. cit.*) recently to postulate their artificial origin.

FIGURE 1. Color pattern of Mars around Syrtis Major (SM) H=Hellas, GA=Gulf of Arabia, UT=Utopia. Colors: Y=Yellow, G=grey, Gr=green, R=red, Or=orange, Cr=cream, Bl=blue, B=black. (*From a color photograph by W. S. Finsen.*)

How can these color and line patterns be explained? Obviously they are land forms and rock colorings. They give the appearance of a colored geologic map with tectonic markings. Since there is a close analogy between Mars and Earth in atmosphere, moons, presence of water, even vegetation, *the analogy of rock composition seems likely too.*

[1]HORST F. VON BANDAT is a consulting photogeologist from Paramus, N. J. Dr. von Bandat received his doctorate in geology from the University of Budapest. He has been affiliated with the Gulf Oil Corporation.

FIGURE 2. Oblique view of a part of Arabia, the "Empty Quarter." The color pattern shows the same combination as Mars. Taken from 20,000 feet. Camera angle 30°. Color pattern: Bl=black, basalt; Rb=red brown, sandstone, lBr=light brown, sandstone, shale; Y=yellowish cream color, shale; Cr=light cream to whitish, loose, shifting sands. *Trimetrogon photograph, USAF* (1803867)

FIGURE 3. Vertical photograph of a limestone plateau rim in the Southwest Sahara. The rock is a creamy colored sandy limestone in horizontal attitude. The rounded dark spots are sinkholes, covered with red brown residual clay. The straight single and double lines have a triangular pattern and are similar to "canals." The fissures harboring shrub vegetation change color with the seasons. Scale 1:40,000. French Guinea, W. Africa, *Photo USAF* (1803635)

All observations point toward the fact that Mars has an arid climate. According to W. Sinton, color changes of the vegetation are the same as on Earth: green in wet seasons, and warm brown in dry, or colder seasons. The rock surface of Mars may be obscured by a seasonal plant growth, because the surface tint changes and the original color of the underlying rock will not show its real value. On vegetationless deserts or in the cool dry season, the rocks will appear in their real tints. There are thus permanent and superimposed color shades.

On *Earth's* deserts (Fig. 2) there are the endless areas of the reddish-brown sandstones, ranging from red-brown through orange to buff, with all shades of brown and yellow. Among these are the intense reds of the residual clays in depressions, on cream-colored light limestone plateaus. Then there is the typical pale yellowish-brown of the shifting loose sands and dunes, which obliterate wide rocky areas in various grades, and there are the impressively contrasting black basalts of the Djebel es Soda—the Black Mountains of the Central Sahara, which are miles-long straight black dikes. There are also the bluish-gray shades of shales like the phyllites and schists of the Arabian deserts and the greenish shades of chloritic metamorphics and basic igneous tuffs. *The color of a rock, of course, is not every time an indicator of its mineral composition,* but when some areas on Mars show colors similar to those of common rock types on Earth, the comparison naturally arises. The large dark regions of Syrtis Major, Bay of Pearls, Dawn, and the Cimmerium area, suggest comparison with the large basalt areas of Deccan (similar shape and extension), the Sahara, or the Columbia River lava fields. Reddish or orange tints suggest sandstones or weathered acid igneous rocks, though the color of weathered limestone in an arid, hot climate may also range between an intense red and light cream, according to the state of its dissolution and accessory minerals. Large poljes, like the red loam-covered Kossowo in Macedonia, with its 60 x 100 km extension, would be visible in our telescopes and may be compared with the "oases" on Mars. Areas of a bluish-gray color may be compared with shales, phyllites, and related metamorphics of the same color, if the features are permanent. Greenish areas, if permanent, could be due to greenish igneous rocks or chloritic metamorphics.

Up to now, we have not had many ideas about "astro-lithology." From craters of the Moon, the 75 per cent igneous crust of Earth, and from tektites, supposed to be volcanic glass, the idea was predominant that the surfaces of other planets are mainly made up of volcanics. Tektite research conducted by V. E. Barnes (*Geotimes*, June 1957) showed rather conclusively that tektites are composed mostly

Continued on page 14

EARTH SCIENCE

by DONALD B. STONE

A successful science course in New York State Schools

From time to time mention has been made in the GeoTimes of the status of geology as a subject in our secondary schools. The reports have always been to the effect that little if anything has been done to promote interest in teaching geology at the high school level, that curriculums are already crowded with required subjects leaving little time for another elective, and that few if any teachers are adequately prepared or even interested in teaching geology anyway. The purpose of this article is to describe what New York State has done with the teaching of geology, or earth science as it is called there, and explain its rapid growth over the past few years.

While geology, or its close relative physical geography, was widely taught in the earlier years of this century, it began to lose place to general science in the early twenties, and by 1950 the subject had gone completely out of existence in many states. Throughout these years of declining enrollment, New York State, recognizing the cultural and practical values of physical geography, and feeling that the course filled a need in the program of many of our high school boys and girls, continued to recommend physical geography as an elective subject. In 1939 the state syllabus was revised to meet the changing needs of modern times, and the name was changed to earth science, a term which seemed to more nearly describe the content of the course. The subject, which has always enjoyed equal standing in all respects with biology, chemistry, and physics, has been taught for many years in about one hundred high schools in the state. The pupils who comprised these earth science classes have until recently been from the tenth, eleventh and twelfth grades.

The year 1949 brought a change of emphasis in Earth Science which has continued to grow with increasing interest throughout the state. In that year "an experiment designed to take care of individual differences as far as science interests and aptitudes are concerned" was tried out by one school. *The experiment consisted of having carefully selected science-minded ninth year pupils take earth science rather than the regular ninth grade general science.* The results that year were so satisfactory that the same school has continued the program without interruption and "has been joined by 94 other schools with a total of 117 ninth year earth science classes throughout the State." Since 1952 the number of schools offering earth science as a full year subject has increased 60 per cent, the number of earth science classes has increased 71 per cent, and the number of students taking earth science has increased 117 per cent. While earth science is still highly recommended for senior high school students it is interesting to note that nearly 50 per cent of all those now taking the subject are selected ninth grade pupils.

Who teaches all these new earth science classes? In most cases the teaching is being done by the regular general science teachers or by other members of the science department who, even though their training has been in some other field of science are doing in most cases exceptionally good work. At present a teaching certificate in general science or in the physical sciences is sufficient to teach earth science in New York State, but effective September 1, 1958 earth science will be included with the other sciences as a separate subject for certification. Definite training, including twelve hours in the earth sciences as the minimum subject preparation, and twenty-four hours in professional educational courses, will be required to teach earth science.

It is fully expected that when the earth science survey for the 1957-58 school year is completed it will reveal that many more schools are offering earth science in the ninth year to carefully selected pupils. If this upward trend of teaching geology and the related sciences to more and more of our secondary school pupils continues, and if it should spread to the other states—and there is indication that it is on the increase in other states—there will be a

[1]DONALD B. STONE, Earth Science Instructor, Mont Pleasant High School Schenectady, New York, has served on the AGI Public Education Committee and is one of the authors of the new AGI career booklet.

ZEITSCHRIFT FÜR GEOMORPHOLOGIE

Volume I of the New Series of the Zeitschrift für Geomorphologie (Annals of Geomorphology) has just been issued. This revival of the leading journal in the field, which was discontinued during World War II, continues the policy of publishing in English, French, and German, with abstracts in a language other than the text of individual articles. It also contains abstracts of papers of general interest. The first number is 110 pages in length, and three or four issues are planned per year, at a subscription price of 42 marks, which may be sent to Dr. Jürgen Hövermanns, Geographical Institute, Herzberger Landstrasse 2, Göttingen, Germany.

Professor H. Mortensen of Göttingen is editor of the new Zeitschrift, assisted by associate editors J. P. Bakker of Amsterdam, A. Cailleux of Paris, N. Nielson of Copenhagen, R. J. Russell of Baton Rouge, La., H. Spreitzer of Vienna, and F. E. Zeuner of London. Manuscripts in geomorphology are solicited and may be sent to any of the editors. One hundred free copies of reprints will be sent to authors of articles accepted for publication.

Also revived is the Revue de Geographie Physique et de Geologie Dynamique, under the editorship of J. H. Brunn, L. Lutaud, J. Boucart, L. Glangeaud, A. Jacquet, J. Gandillot, M. Pradel, and Cl. Recordon. The subscription price of $8 per year may be sent to Masson et Cie., 120 bd. Saint-Germain, Paris VI, France.

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greater need for teachers trained in the geological sciences. College geology departments can help to promote earth science teaching by offering courses in the geological sciences to local high school science teachers. The National Science Foundation has already been of great assistance to our teachers by helping to make it financially possible for them to attend summer school institutes of science.

The increased interest in the earth sciences in our schools across the nation should bring with it a wider knowledge of the geologic sciences to the general public. This in turn would mean a better appreciation of the geologist and the fundamental role he has been playing in the industrial development and growth of our country.

A HELPING HAND NEEDED

University of Puerto Rico starting Geology Department

A department of geology is in the making at the University of Puerto Rico and there are many needs in building a library, fossil and mineral collections, and other materials which are essential to a new department.

In 1955 Dr. John D. Weaver went to the University of Puerto Rico as a Visiting Professor of Geology to teach one course in geology for Civil Engineers. The course was well received and Dr. Weaver was asked to remain on the faculty as Professor of Geology to develop a department. He was transferred from engineering to the Faculty of Science and geology and is attached to the Biology Department until it attains full departmental staus. Although a full curriculum of geology courses adequate for a major has been introduced, the principal enrollment is in service courses for engineers, agronomists, etc. A second faculty member in geology was added in 1957 and another addition is planned for 1958.

The University of Puerto Rico has a long-range objective—the building of a graduate school which will attract students of Latin America.

There is ample opportunity for basic research in geology in Puerto Rico. In conjunction with the University Institute of Marine Biology, a strong program in marine geology is expected to develop. A seismograph obtained from the U.S.C. and G.S. has been installed at the marine laboratory, and the AEC is sponsoring work on the campus which will strengthen the science program. The U. S. Geological Survey has a field office in Puerto Rico. Currently, geologists of the University faculty are conducting research on Puerto Rican granodiorites and foram zoning in Tertiary beds.

The library of this embryonic department of geology would welcome U. S. and foreign geological journals for years prior to 1956 as well as publications of the U.S.G.S. and state surveys. The department would also be interested in exchanges of geological collections.

If you are interested in helping to establish the library and collections in this new department, we urge that you write *Professor John D. Weaver, University of Puerto Rico, Mayaguez, P. R.*

Recruiting Talented Geology Students

by Ivy Towers

We hear educators in geology moan that the geological sciences are not getting their share of top-notch science prospects. They point out that many of these students do not hear of geology until they are firmly entrenched in a college curriculum in one of the other sciences when it is impractical to change to a major in geology. If this line of reasoning is true, then our departments of geology are certainly not availing themselves of opportunities to correct this situation.

For several years the National Science Foundation has sponsored Summer Institutes conducted by colleges and universities for the improvement and teaching of science and mathematics principally in the high schools. The Summer Institute program has been considered most successful and the program has been considerably expanded.

Despite the general enthusiasm over the results obtained by the Summer Institute program, there has been little or no interest and enthusiasm shown by the departments of geological science in seeking or participating in these NSF sponsored programs.

In an editorial *Where is Geology?* (GeoTimes, June 1957) attention was drawn to the poor record of participation of geology departments in the Summer Institute program. The National Science Foundation only recently announced the 1958 Summer Institute grants and we find that earth sciences have actually lost ground in participation in the Summer Institutes.

In the summer of 1958 there will be 103 institutes open to high school teachers of science and mathematics and earth sciences will be included in the program of only 12 of these institutes. There were 16 out of 86 institutes which included earth sciences in 1957, so geology has lost ground by actual count and even more in percentage participation.

The 1958 Summer Institute program provides for 33 institutes sponsored by a single department on a college campus, while there will be 65 institutes to aid high school teachers that will feature cooperation of one or more departments. Among these 65 institutes which feature interdepartmental cooperation we find an earth science program planned in only 11. Several of these 11 institutes are at schools which do not have a geology department. On the other hand, there are degree-granting departments of geology or geophysics on the campuses where 29 of the other 54 interdepartmental institutes are being held.

Among the 33 institutes sponsored by a single department only one is devoted to earth sciences. This, sponsored for the second year by the Department of Rural Education of Cornell University, emphasizes conservation. There are geology departments on the campuses where 24 of these 33 institutes are held.

Whether geology as a subject should be introduced to the junior or senior high schools of our land is debatable. It is indisputable, however, that elementary, and junior and senior high school students should be introduced to the geological sciences in their science courses. General science courses frequently include a unit on geology. Many principles of chemistry and physics may be forcefully illustrated by drawing on geology.

We cannot expect science teachers to introduce students to geology if we have no interest and initiative in introducing science teachers to this area of science.

The geology courses sponsored for high school science teachers by the Tulsa Geological Society, the R.M.A.G. and several of the state geological surveys during the past year indicates a great enthusiasm for science teachers for an introduction to the geological sciences. The professors of geology who are critical of the quality of the students entering geology should engage in some serious self-examination. Are they doing what should be done to recruit good students? Summer Institutes afford one approach among many which are open to geologists who want to create student-awareness of the geological sciences. The approach requires careful planning and some extra effort, but the payoff comes only with action. We usually get only what we work for, so, if we want better talent in geology we must work to attract more capable students.

GEOLOGIST MAYOR

Geologist Rollin Eckis has been elected mayor of Bradbury, California. The city, situated in the Los Angeles County, was incorporated in May 1957. Eckis, who is now with the Richfield Oil Corporation, is the author of a much-used bulletin of the California Division of Water Resources, "South Coastal Basin Investigation, Geology and Ground Water Storage Capacity of Valley Fill."

RESEARCH OPPORTUNITIES

The Department of Oceanography and Meteorology at the A. and M. College of Texas has announced the availability of fellowships and research assistantships to qualified graduates in physics, chemistry, geology, meteorology, biology and engineering for 1958-59. Included are three fellowhips with stipends ranging from $1,800 to $3,000 and research assistantships ranging from $1,800 to $2,775 for 12 months.

Costs for residents of Texas (matriculation and other fees, board, room rent, and laundry) are approximately $600 for the academic year. Additional fees for out-of-state students are $150 per semester.

Fields of emphasis include interaction between ocean and atmosphere, marine meteorology, radar meteorology, ocean waves and wave forces, weather analysis, water level problems, micrometeorology, agricultural meteorology, marine geochemistry, carbon dioxide relationships in the sea and atmosphere, radioactive and industrial waste disposal, comparative biochemistry of marine organisms, organic composition of marine sediments, demineralization of sea water, estuarine pollution, coastal and estuarine geology, trace minerals, and bacteria-phytoplankton relationships in the sea.

Application forms may be obtained from the *Head of the Department of Oceanography and Meteorology, the A. and M. College of Texas, College Station, Texas.*

MAINE GEOLOGICAL SURVEY

The Maine Geological Survey, a division of the Department of Economic Development, has undertaken an aeromagnetic and geologic reconnaissance survey of an area comprising one million acres in south central Maine. The project has been contracted to the James W. Sewall Company, Consulting Engineers, Old Town, Maine, with the aeromagnetic survey subcontracted to Aero-geophysics, Inc., Los Angeles, using a Varian nuclear precession magnetometer. The aeromagnetic survey includes three widely spaced groups of long flight lines with fill-in in anomalous areas. Geologic mapping includes compilation of reliable data from various published and unpublished sources in addition to reconnaissance mapping on the ground and from the air. John R. Rand, State Geologist, anticipates that the survey will be completed for a release date late in February 1958.

GEOLOGY in the Public Eye

by Robert L. Bates

Late in 1957, geologists in central Ohio had the untidy task of removing a gob of mud from the public eye.

On November 3, the Columbus *Dispatch* bannered a front-page headline, "Ohio Soil Found Rich in Atomic Fuel." The story, by the paper's business writer, informed the public that (1) a thousand billion tons of uranium-bearing shale and sandstone lie beneath Ohio soil; (2) a Columbus tax consultant has a patented milling process that makes recovery profitable; (3) the uranium discovery was made by one L. W. Huntington, a "nationally known geologist-mining engineer"; and (4) "most of the known uranium is in a glacial-deposit strip 5 to 20 miles wide" extending north-south across the state. A bedrock map was reproduced—without credit—from a publication of the Ohio Geological Survey.

Most of the above statements were repeated in a story the next day, which said, correctly enough, that the first report had "caused amazement."

There shortly followed, however, a dignified back-track by the *Dispatch*. Ralph Bernhagen, chief of the state survey, pointed out that uranium in the Ohio shale has been known for a long time, but that its average concentration is far below that required by the AEC. The AEC's recent announcement was cited, to the effect that it no longer intends to expand production of uranium concentrate. Mr. Huntington turned out not to be an accredited geologist or engineer, but a "self-made" man who had been on court probation for 3 years for selling unregistered securities.

No explanation, however, was given for the soil-glacial-deposits-bedrock snarl in the first stories, and presumably thousands of Ohioans believe the Ohio shale was somehow "shoved into" the state by "the gigantic ice sheets of many centuries ago."

So far as geology is concerned, surely this was irresponsible journalism's finest hour—at least in 1957. Who knows what 1958 will bring?

It seems to this column that Mr. Huntington, plus those two "geologists" that stole the Gulf maps, are a fine argument for professional licensing of geologists.

MANPOWER *in a column —*

By HOWARD A. MEYERHOFF
Scientific Manpower Commission

The initials USIAESTENC read like something that only a new government agency or a labor union could concoct, but such an inference is far from the fact. "US," of course, stands for the United States, and the terminal "NC" stands for National Committee, the core of the abbreviation, IAESTE, signifies the "International Association for the Exchange of Students for Technical Experience."

IAESTE is nearly 10 years old. Organized in consultative relationship with UNESCO in 1948, it has arranged the exchange of nearly 35,000 students among the 18 countries holding full membership and the 4 holding associate membership in the organization.

This is not the customary type of student exchange. Qualified undergraduates, usually those completing their junior year, and almost exclusively those majoring in engineering and the sciences, are selected for a summer of on-the-job training with an industrial company in a foreign country. Every effort is made to send each participant to the country of his choice and to an industrial organization engaged in the field of his major interest. Each country accepts only as many students as it can place, and it sends an equal number abroad. The number of placements, in turn, depends entirely upon the cooperation of domestic industries.

In the United States, the Institute of International Education (at 1 East 67th St., New York 21, N. Y.) is serving as the secretariat for IAESTE. Some 41 U.S. companies have employed IAESTE trainees, mostly from Western Europe, and during the summer of 1957, 84 students were accommodated, and 84 U.S. students went abroad on this summer employment arrangement. Since the total number of trainees exchanged in 1957 approximated 6,000, simple division will demonstrate that the United States is not a particularly strong participant in the program.

Although it is improbable that an undergraduate, employed for only 3 or 4 summer months, will contribute much to his employer, nonetheless he is a prospective representative of the employing company in the country from which he came; and he will return to his native land with an invaluable knowledge of American practices and policies. Despite the fact that geologists and mining engineers are among the most traveled of technological personnel, the list of participating companies in the United States contains only 4 concerned with the mineral industry. Notwithstanding its present geographic limitations, IAESTE looks like a good program for prospective geologists and geophysicists who wish to spend their junior summer abroad acquiring language, travel, and industrial experience.

EXPLORATION MANAGEMENT CONFERENCE

The American Management Association is sponsoring a workshop seminar on Management Problems in Exploration and Production at the Sheraton-Astor Hotel, New York, January 27-29, 1958. The sessions will be moderated by Mr. Zeb Mayhew, Assistant Producing Coordinator of the Standard Oil Co., Inc., and Mr. Norman Donald, Manager of Exploration, St. Joseph Lead Company. The seminar will be limited to a relatively small group of executives from mining and petroleum companies.

The theme will focus on the importance of strategic planning in the successful conduct of a sound long-range exploration program. The discussions will touch on pressing problems relating to exploration and production management, factors involved in planning for the future, evaluation of exploration risks, reactions to periods of adversity, operational techniques and public relations.

Persons interested in this program may write to *American Management Association, 1515 Broadway, New York 36, N. Y.*

CARLETON COLLEGE HOLDS TEACHERS INSTITUTE

The Geology Department at Carleton College is participating in one of the eighteen National Science Foundation-sponsored in-service institutes during the current academic year. Participants in the institute are a selected group of general science teachers from schools within a fifty-mile radius of the campus at Northfield, Minnesota, and the objective of the program is to improve the training of science teachers in science and mathematics. The institute, which is conducted in the evenings and on week-ends, is featuring astronomy during the first semester and will be devoted to geology during the second semester. Dr. Duncan Stewart, Professor of Geology, will conduct the geology program.

UNIVERSITY OF ILLINOIS

Holds Institute for College Geology Teachers

The National Science Foundation has awarded a grant to the University of Illinois in support of a second *Summer Institute in Geology for College Teachers.* The institute will be held at the Department of Geology, Urbana, from June 16 to August 9, 1958 and will again be conducted by D. M. Henderson and A. F. Hagner of Illinois and R. M. Garrels of Harvard.

New approaches and techniques in the geological sciences, stimulated by contributions from the related fields of chemistry, metallurgy, physics, and mathematics have altered the character of the educational background needed for creative geological work. The program will be designed to assist college teachers in improving undergraduate preparation in geology. The aim will be to demonstrate general methods of approach rather than to attempt to "cover" the entire field. The program will center around the treatment of different kinds of geologic situations in terms of the nature and properties of the constituent phases and chemical components. This central theme was selected because of the generality and fruitfulness of a broad geochemical and mineralogical approach to problems as diverse as those in igneous and metamorphic petrology, sedimentation, mineral deposition, tectonics, and geomorphology. The interdependence of a variety of methods of attack such as field, experimental, theoretical, chemical, petrographic, nuclear, and statistical will be stressed.

The program will be in four parts: 1) The first four weeks will be devoted to a simple development—through lectures, discussion, and laboratory work—of the nature, properties, geologic relations, and methods of study of the chemical constituents, mineral phases, and mineral aggregates of the earth, 2) mornings of the second four weeks will feature a series of lectures by approximately eight eminent geologists from throughout the country who will discuss their research as examples of the problems they face, mental approach, and methods of attack, 3) afternoons of the second four weeks will be devoted to individual research problems, and 4) informal activities will be arranged in accordance with the desires and needs of the group and of individuals.

Visiting speakers will live with the group, providing participants the stimulus of close contact with outstanding contributors to geology. In the laboratory, participants will make use of such techniques as X-ray diffraction, Eh-pH measurements, electron microscopy, and different types of spectrography.

Twenty-six teachers will be selected to attend. Each will receive a stipend of $600 plus $120 for each dependent up to four, and an allowance for travel.

Circulars and application blanks are being mailed to geology departments throughout the country. Applications and further information may be obtained from: *D. M. Henderson or A. F. Hagner, Department of Geology, University of Illinois, Urbana, Illinois.*

MISSION 66

The American Geological Institute has recently appointed a Committee on Mission 66 to work in liaison with the National Park Service to improve the presentation of geology in the National Parks and Monuments.

Members of the Committee are:

Chairman James L. Dyson, Lafayette College
Douglas Ball, Ball Associates, Denver
Fritiof Fryxell, Augustana College
Bennett T. Gale, National Park Service, San Francisco
J. L. Gillson, duPont Company
J. B. Reed, U.S. Geological Survey, Washington
Howel Williams, University of California, Berkeley

The Committee for Mission 66 was appointed at the suggestion of National Park Service Directors Conrad L. Wirth, who has stressed the fact that there are many ways which the geological profession can advance public awareness of geology through assisting the Park Service in the better presentation of geology.

LOCKERBIE MINERAL COLLECTION

Recently Mr. and Mrs. Charles W. Lockerbie of Salt Lake City presented a large collection of rocks and minerals to small Westminster College, located in Salt Lake City. The consolidated Eureka Mining Company and the Rico Argentine Mining Company contributed attractive, illuminated display cases to house the collection.

The Salt Lake Tribune in an editorial made the following very appropriate comments, "The Lockerbie gift emphasizes among other things that gifts need not be financial in nature to be valuable in advancing education and historical perspective. We . . . need to be reminded periodically of the need for more gifts to educational institutions from the works of individuals as well as from the wealth of corporations."

FIGURE 4. An escarpment of outcropping dark brown rock, forms a "cuesta" or dipslope "rib" of 20 miles length. The beds right are folded into anticlines but are near parallel to the dark cuesta at left. Such features may suggest a "canal" or show as an irregular double line. Northwest Sahara. *USAF photo.* (1803676).

Continued from page 7

of molten sediments, like sandstone, clay shale, metamorphics, and only in some cases, igneous rocks. Therefore we may assume with Urey and Barnes that tektites are molten particles of once molten sediments from an exploded asteroid. *Since existence of extraterrestrial sediments has been proved, the similarity of sediments on Mars and Earth is likely and logical.*

The second group of features on Mars are the "canals." G. P. Kuiper (*P. Ast. Soc. Pac., 67,* 1955), an opponent of the canal theory, thinks they are fractures of the surface, and this is the impression that most geologists will have. It seems that the lesser gravitational pull makes Mars' fracture pattern more conspicuous than that of Earth.

The "broad" canals may be compared to our large rift valleys of Africa, the Red Sea, and deep-sea troughs. An interesting feature near Orcus shows the termination of two broad canals by a long thin perpendicular one, a rather common tectonic feature on Earth. Geologically, one has the impression that the broad canals are *grabens* or *trenches,* displaying darker tinted rock or vegetation at their bottoms.

The thin canals have a black or bluish color. They are thousands of kilometers long, but only a few kilometers wide, and resemble fault fissures on Earth.

On Earth there are several types of fault manifestations. They may be scarps, which are straight contact zones between different types of rock, or just straight scars or lines, often with vegetational markings. One of the most conspicuous fault patterns on deserts is that observed in horizontally bedded limestones of granular texture (Fig. 3). Uplifted old barrier reefs, like those of Florida, Yucatan, Southwest New Guinea, and the Sahara show the criss-cross pattern eloquently. Their shape, width, and length vary widely from meters to kilometers. The conspicuousness is due to: (1) solution of the crushed rock with sinkhole and polje forming, and (2) vegetation, preferring the moisture and shelter of the cracks and depressions. The result is a striking "Mars pattern," although there is a rather huge discrepancy in scale. An aerial photograph shows only some dozen square kilometers, but a composite mozaic will show that the emphasis is *not on size, but on the tectonic pattern.* Reduced a thousand times, the small features will disappear and the large rifts will become fine. This pattern is typical with limestones, but may occur in any soluble mass of rock, like gypsum or salt.

An alternate explanation of the radial line pattern may be found in the basalt dikes visible in the deserts of North Sudan. These are lava-filled cracks of very dark rock, sometimes radiating from extrusion centers. Broad basaltic extrusions are often found *at cross-points of fault systems,* which would make them similar to the dark oases of the broader canals. The possibility that limestone may cover some limited areas on Mars—sustained by a peculiar fracture pattern and color—is speculative. Huge limestone areas, such as the Great Barrier Reef of Australia, are created by small animals, like coral polyps and algae. They may thus constitute the first probability of an extinct animal life on Mars. Coral reefs thrive only in shallow, warm, plankton-rich seas, where sea-level changes occur. Coral reefs may "follow" a receding ocean, or may be drowned when the waters advance. Was Mars covered by large water bodies millions of years ago? Are drying-out, receding seas responsible for extensive limestone deposits, gypsum, or salt crusts that behave tectonically like limestone? Has this process interrupted prematurely the evolution of living forms, or forced them to adapt themselves to adverse scarce water conditions? Calcium is present in every drop of water, in every living being, animal, or plant on our Earth. Why should it be absent on Mars which shows such a great similarity to our planet? Limestone is just as common a member of the rock family as sandstone or shale deposited or precipitated from water.

These are all far advanced speculations to which we have no answer at present, but rapidly developing new methods of research may give us an answer to some of the ideas discussed in this article. The most likely method of obtaining an answer about the rock composition of the planet's crust would *be the infra red absorption method,* used by Sinton to indicate presence of hydrocarbons on the surface of Mars. Comparison with absorption characteristics of terrestrial rocks like sandstones, shales, limestones, basalts, would shed light on an extraterrestrial rock composition, strongly suggesting similarity with conditions existing on Earth.

U.S.G.S. CITED BY ANTIOCH COLLEGE

Little Antioch College in Yellow Springs, Ohio has achieved distinction in educational circles for its broad program of cooperative education. Students at Antioch alternate between periods of on-campus academic training and off-campus "learn-while-you-earn" experience. Although Antioch does not grant degrees in geology, they offer a number of geology courses. The U. S. Geological Survey, for its cooperation in the program, recently received the following citation from Antioch's President S. B. Gould:

"Since 1947, sixty-two Antioch students, as temporary employees of the United States Geological Survey, have tramped the hills and deserts with professional geologists, helping to map topography, to drill cores, to scan mine dumps, and to keep records of ground water levels. In its laboratories and offices, they have analyzed minerals, prepared clay samples for X-ray examination, plotted aero-magnetic data, and edited manuscripts. They have done these tasks in Washington, D. C., or in the field, from South Dakota to Puerto Rico and from Colorado to Connecticut. The common and outstanding testimonial from these students has been a deep appreciation of the professional and clerical staffs of the United States Geological Survey who have consistently inspired students with their dedicated practice of public service of high quality.

"Antioch College is proud to acknowledge its gratitude to the United States Geological Survey for making available these sub-professional jobs and for the friendly interest of its staff members, who in this way become a part of the College's field faculty. This citation is particularly appropriate today since this graduating class includes the largest number of geology majors in our history, all of whom have had the privilege of working at least one period for the Survey.

"In token of this outstanding contribution to cooperative education, Antioch College is pleased to award this citation to the United States Geological Survey."

GeoTimes Goes to 29,000

GeoTimes goes to members of the Member Societies of the American Geological Institute as a condition of their membership in that Member Society. GeoTimes is supported by income from advertising and voluntary contributions of individuals.

Popular Geology in Print

by Mark W. Pangborn, Jr.

Novelist *Kenneth Roberts'* Water Unlimited (Doubleday, 1957, $3.95) is his third book about dowser Henry Gross, whose rod not only locates "domes" and "veins" of water but can prophesy gallons per minute and water quality, and operates just as well when suspended over a map as it does over the ground itself! Over 25,000 copies of these amazing works have been sold, which indicates that a lot of people might be interested in a good popular book on ground water . . . how about it?

Youngsters 7 to 10 will enjoy The River's Journey, by *Anne Marie Jauss* (Lippincott, 1957, $2.50), in which 23 charming illustrations and a text trace a typical river from source to delta. For the 9 to 13 year-old group are Water is Wonderful, by *Mary I. Curtis* (Lyons & Carnahan, 1955, $.99), a well-rounded discussion of water in nature and its uses by man, and All About Great Rivers of the World, by *Anne Terry White* (Random, 1957, $1.95), a geography of 5 rivers—the Nile, Amazon, Yangtse, Volga, and Mississippi—in Mrs. White's usual vivid style.

Another of the good "Allabout" series is *Sam* and *Beryl Epstein's* All About The Desert (Random, 1957, $1.95), which explains what deserts are and then describes some of the best known.

Every geologist who works in the West will want a copy of *Edmund C. Jaeger's* The North American Deserts (Stanford University Press, 1957, $5.95). About half of the book describes the geography and natural history of the desert areas; the remainder consists of text and black and white drawings which will aid in identifying desert plants and animals. A good brief bibliography concludes this useful and interesting work.

Two recent caving books which will intrigue the layman are One Thousand Metres Down, by *Jean Cadoux* (A. S. Barnes, 1957, $3.75), which deals with a tremendous cavern near Grenoble, France, and The Caves Beyond, by *Joe Lawrence, Jr.*, and *Roger W. Brucker* (Funk & Wagnalls, 1955, $4.75), the exciting story of a large-scale expedition to Kentucky's Floyd Collins Crystal Cave.

DEAR EDITOR:

I have just returned from two years in India, as advisor to the Geological Survey of India on ground water, with major effort on the All-India Exploratory Tube-wells Project. My assignment was under the Technical Assistance Program of the International Cooperation Administration, U.S. Department of State. While in India I was very happy indeed to receive copies of GeoTimes, which temporarily dispelled my feeling of isolation, and made me aware of what was going on in the geological profession at home. Please send my copy of GeoTimes to Memphis, Tennessee, where I have been reassigned by the Ground Water Branch of the U.S.G.S.

Very truly yours,
PAUL H. JONES

DEAR EDITOR:

I believe it is time that we devote some attention to those who train our geologists. There are too many who teach not because of the personal satisfaction that one gets out of teaching, but because of the supposedly short hours, the sedentary life, and because there is not as much of the produce-or-else pressure that exists in industry. Some devote most of their energy and time to consulting, research, or the publication of papers, paying very little attention to the needs of their students. In some cases the teachers are not at fault, for some departments require that they turn out papers or else lose their positions or chances for advancement. The faculty member may not be a competent researcher, but publish he must. Some people would like to devote most of their time to teaching, whether the prestige-seeking departments like it or not. Research should be encouraged, but not at the expense of good teaching.

I would not care to have our colleges standardize their geology curricula. In diversity there is strength.

I believe that the quality of teaching could be improved in many of our geology departments. Many teachers give exams that can be graded by themselves or by their graduate assistants in the shortest possible time. Their exams require no thinking nor any expression of ideas, but only a regurgitation of facts. In most cases, these teachers assign a text and read their lectures from another book. Almost invariably they consider themselves to be excellent teachers.

It is the duty of the chairman of the geology department to see to it that he has the best teachers available and to replace the "book readers." I do not suggest that academic freedom be infringed upon in any way, but I do believe very strongly that the chairman should make sure that the professors are teaching and not reading, and that high standards of teaching are maintained.

Yours very truly,

VICTOR COLOMBINI
Louisiana Polytechnic Institute

GEOLOGICAL SURVEY
WEST VIRGINIA FIELD OFFICE

GENTLEMEN:

I doubt, very much if you have ever rec'd a report like this is going to be.

Last Sat. I found the door on the bldg. I go to check for you almost covered with old time black *wasps*. When I opened the door I found a real swarm. By working easy they allowed me to check the recorder and get out quickly but when I closed the door (a little nervous) I let it bang just a little and when I snapped the lock they began to dart at me and no one had to tell me they meant for me to get away and oneof (sic) them gave me a notice to hurry by giving me a hard sting on the hand. I thought they would leave in a day or two but when I went back on Tuesday I found them thicker than before. I went back yesterday and found the groove on the hinge side of the door completely filled. *I didn't try to go in.* I want you to think out a plan to get rid of them and when you come to Franklin on your next trip stop in and tell me about it.

Very truly yours,
OBSERVER

DEAR EDITOR:

We have read with interest the recent news releases by national organizations in physics and chemistry concerning a program for producing a series of motion pictures to assist in teaching physics and

chemistry on the high school level. Two clippings from recent issues of the New York Times are enclosed. In essence, grants totaling $500,000 and $1,600,000 have already been made to chemistry and physics respectively for this purpose by the U. S. Government and various private philanthropic organizations such as the Ford Foundation.

Earth Scientists have long favored teaching geology in high schools but with little possible hope for attaining more than a very limited realization of this goal. At last, as a result of a chain of circumstances, we have a concrete opportunity to "get our foot in the door" in high school education.

Because of the great present public and political interest in science, and the seeming willingness to back up such interest with hard cash, it seems apparent that an opportunity of this unique character may well never develop again.

Whether or not we take advantage of this opportunity depends almost completely upon the vision and aggressiveness of the American Geological Institute and her member societies.

Would the Institute consider the feasibility of organizing, with the assistance of one or more of the societies, some such similar program in the Earth Sciences?

Sincerely yours,

ANDREW H. MCNAIR
RICHARD E. STOIBER
JOHN B. LYONS
ROBERT W. DECKER
DAVID D. SMITH
Dartmouth College
Department of Geology

DEAR EDITOR:

The science departments of the University of North Carolina are in agreement with your editorial on "Teaching for Teachers" in the November issue of *GeoTimes*.

Several years ago most of our high school science teachers working toward graduate degrees were limited almost entirely to education courses, as there were few science courses that they could take for graduate credit. Most of our science departments (botany, zoology, physics, chemistry, mathematics, and geology) now give graduate science courses designed especially for (and limited to) high school teachers. Our colleagues in neighboring institutions are accusing us of giving a watered-down graduate degree. Perhaps we are, but we feel that the substitution of sub-graduate level science courses for education courses will increase greatly the quality of science instruction in our high schools.

Sincerely yours,

ROY L. INGRAM
The University of North Carolina

ATOMIC ENERGY APPLICATIONS, *with Reference to Underdeveloped Countries, by B. C. Netschert and S. H. Schurr, 129 pp., 1957, published for Resources for the Future, Inc., by the Johns Hopkins Press, Baltimore, $2.00.*

COLORADO MEASURED SECTIONS, *a symposium of the Rocky Mountain Association of Geologists, Edwin D. McKee, Editor. Set of 12 strip logs with accompanying text, 70 pp., 1957. Available from Petroleum Information, P. O. Box 2612, Denver, Colorado, sales agent for RMAG, $14.00.*

An assemblage of composite measured surface sections in twelve scattered outcrop localities of Colorado. Scale of the strip logs is 1″=100′. An explanatory text accompanies the set of logs.

The sections are described in varying degrees of lithologic and paleontologic detail. Much of the data has been gathered from unpublished sources, and most of it is more recent than 1950. Those log strips of poor reproduction quality may be exchanged for legible copies.

This bound volume provides geologists with a set of surface sections described in sufficient detail to be a useful tool in subsurface sample and electric log correlation in Colorado.

N. R. R.

ECONOMICS OF ATOMIC ENERGY, *by Mary S. Goldring, 179 pp., 1957, Philosophical Library, New York, $6.00.*

One of a series of books in the Atoms for Peace series edited by D. Wragge Morley, this book stresses particularly the economics of atomic power. It is written from the British point of view, which, of course, is interesting, inasmuch as economics favor earlier utilization of atomic power in Great Britain due to deficiencies of low-cost petroleum and coal.

THE PROTEROZOIC IN CANADA, *A Symposium, Jas. E. Gill, Editor, The Royal Soc. of Canada, Special Publication No. 2, 1957, 191 pp., University of Toronto Press, $5.75.*

As a result of greatly accelerated geological investigations in areas of Proterozoic rocks in Canada in recent years, much new information is available to contribute to a general understanding of these rocks. Much of the data has come to light as a result of mineral exploration. There are more than 20 contributors to this important symposium volume which is a significant contribution to the knowledge of the early geologic history of North America.

THE FEDERAL LANDS: THEIR USE AND MANAGEMENT, *by Marion Clawson and Burnell Held, 539 pp., 1957, The Johns Hopkins Press, Baltimore 18, Md., $8.50.*

This book was prepared by staff members of Resources for the Future, Inc. It discusses federal lands from a historical standpoint, the uses of the lands, policies, financial aspects, and speculates as to the future of federal land.

The growing importance of income from petroleum and mineral lands and submerged areas is pointed out. It is pointed out that the income and expenditures pertinent to public lands are comparable in magnitude to those of some of our larger corporations. The authors are of the opinion that federal land management should be thoroughly reviewed and reorganized.

OCCURRENCE OF OIL AND GAS IN WEST TEXAS, *Frank A. Herald, Editor, 456 pp., 3 tip-in maps, 1957, University of Texas Publication 5716, $10.00.*

This publication has resulted from a cooperative project of the West Texas Geological Society and the Bureau of Economic Geology. It contains descriptions of 112 producing fields, together with structural and stratigraphic data. Returns from sales of this volume will be channeled into a revolving research and publication fund to be known as the West Texas Geological Fund.

GLACIAL MAP OF THE PROVINCE OF QUEBEC, *by R. J. E. Sabourin, scale: 1 inch to 32 miles, Department of Geology, Laval University, Quebec, Canada, $2.50.*

Data on ice movement and other glacial information compiled on new official Quebec base map. Helpful to scientist and prospector.

NEW *Ideas Products Services*

GEO-TIMES will welcome press releases and notices of new ideas, products and services from companies and individuals for possible use in this section.

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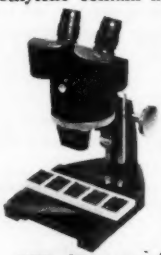

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SOIL SAMPLING EQUIPMENT BULLETIN describes in detail soil samplers and accessories used under varying conditions and with differing soil types. Write requesting *Bulletin 300 GT, Sprague & Henwood, Inc., Scranton 2, Pa.*

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WICHITA UNIVERSITY, Wichita 14, Kansas. Rank and salary dependent upon qualifications. Ph. D., to teach mineralogy and related courses. Write J. R. Berg, Dept. of Geology.

UNIVERSITY OF IDAHO invites applications for the position of Head of the Department of Geology and Geography effective September 1, 1958. Rank and salary depend upon qualifications. Submit full particulars and references to Dean, College of Mines, University of Idaho.

YALE UNIVERSITY. Laboratory technician (permanent position) to take charge of rock and mineral preparation and experimental work. Specific knowledge of experimental techniques with rocks, minerals, and ores not essential if applicant has background and aptitude for laboratory work. Department of Geology, Box 2161, Yale Station. New Haven, Conn.

MISSISSIPPI SOUTHERN COLLEGE—Hattiesburg, Mississippi. Associate Professorship beginning September 1958. Ph.D. required. Area: Mineralogy, Petrology, and Economic Geology. Salary range $5000 to $6000 (9 months) depending upon experience and qualifications. Apply to Dr. Olin T. Brown, Chairman of Department.

PHOTOGEOLOGIST-GEOMORPHOLOGIST for Structural Analysis in Western Canada with a progressive consulting organization. Salary commensurate with experience and ability. Send complete resume to Box 85 GeoTimes.

LION OIL COMPANY—Sedimentologist and Stratigrapher for research position in Rocky Mountains. At least one year graduate work in geology and three years experience. Must be able to do independent, creative work. Write Mr. A. L. Bergren, c/o Lion Oil Company, 1310 Denver Club Building, Denver 2, Colorado.

VACANCY: Maine Geological Survey—Applications will be accepted until April 1, 1958, for the position of Geologist III ($107-$133 per week after July 1.) Competitive examination to be scheduled. Office duties with some project field work. Write J. R. Rand, Augusta, Maine.

ROCK CHIPS

by SANDSTONE SAM

Der geomorphologister ist ein studenten ab landskape gebildung und downgewearung was gespreche mit ein grosser vocabularen, becloudet thinken, und viel armgewavin.

• • •

Satchel Paige Health Rules:

- *Avoid fried meats which angry up the blood.*
- *If your stomach disputes you, lie down and pacify it with cool thoughts.*
- *Keep your juices flowing by jangling around gently as you move.*
- *Go very light on the vices, such as carrying-on in society; the social ramble ain't restful.*
- *Avoid running at all times.*
- *Don't never look back; something may be gaining on you.*

• • •

The complaining econ. geology student says, "An exam in this vein is quite a lode for this gangue!"

• • •

"At Mogollon, the Fanny Mine bottomed at about 1,300 feet . . ." Econ. Geol. Vol. 52, p. 478.

GEOLOGISTS AND GEOPHYSICISTS

(South America)

Major oil company has immediate openings in expanding South American operations for graduate geologists; also geophysicists experienced in interpretation and supervision. Working knowledge of Spanish desirable. Career positions. Forward personal data and college transcript to: Box 82.

POSITIONS WANTED

BOX 359. GEOLOGIST, B.S., 6 years exploration in the Four Corners, Panhandle and West Texas. Experience includes seismograph and administration. Desires more responsibility. Excellent references.

BOX 364. ENGINEERING GEOLOGIST, experienced in all phases of ground-water, water-supply, and waste-disposal problems. Desires responsible position, foreign or domestic.

BOX 372. CONSCIENTIOUS teacher, Ph.D. GEOLOGY, seeks unpressured academic environment. Available June.

BOX 378. GEOLOGIST, M.Sc., age 44, married. 19 years experience mining and exploration. Desires position as lecturer economic and structural geology.

BOX 379. PETROLEUM GEOLOGIST, B.S. in Geology, 16 years diversified domestic and foreign experience in geology, paleontology, geophysics, land-lease, last 10 years in California with one major oil company. Wants domestic or foreign position. Capable of organizing exploration group or micropaleo-stratigraphy laboratory; age 43; married; geological experience in the Middle East, South America and the U. S. Mid-continent.

BOX 381. GEOLOGIST, 30, M.S., major in structural geology and minor in education, 5 years experience in numerous phases of oil exploration. Desires research and/or teaching position in a survey, university or college with facilities for Ph.D. with publication privileges.

BOX 382. GEOLOGIST, B.S., 36, family. Presently USAF officer teaching Air Science at Institute of Technology. Navigator. Speak German. Good language aptitude. Desires work in mining or petroleum U. S. or overseas.

BOX 385. ASSISTANT PROFESSOR with family, Ph.D. and extensive teaching and field experience. Desires 1958 early Summer or Fall teaching opportunity at advance of rank and salary. Chairmanship small Department attractive.

BOX 386. ASSISTANT PROFESSOR, 41, Ph.D. Interested in possibilities of full-time research with petroleum company or research organization. Specialty Rocky Mountain Mesozoic and Tertiary Stratigraphy. Will consider summer work as introduction.

BOX 388. GEOLOGIST, Ph. D., 29, married, desires career teaching and research position in Midwestern or Eastern college or university. Background in stratigraphy, micropaleontology, sedimentology, petrography, and related fields. Industrial and teaching experience.

CIVIL ENGINEER, 40 years experience all kinds of surveys in the States and in Central America, roads, assistant to geologists on exploration, construction, etc. Available for work in Central America or Panama. Apartado 4165, San Jose, Costa Rica.

BOX 389. GEOLOGIST, Ph.D., 49, family. Desires teaching position or administrative-teaching responsibilities in college or university. Interest in sedimentation, petroleum geology, groundwater, sedimentary petrography, stratigraphy, and geophysics. Willing to teach elementary geology, structural geology, "hard-rock" courses, and invertebrate paleontology. 7 years teaching in major university; 16 years experience in petroleum and metals exploration. U.S.G.S. rating of GS-12. Registered geologist. Widely travelled. Excellent references.

BOX 390. GEOLOGIST, Ph.D., several years experience with mining company and U.S.G.S. in base and rare metals and uranium, desires position with mining or chemical company. Prefer domestic position but will consider foreign assignment.

BOX 391. GEOLOGIST, Pakistani, 30, single, Ph.D. in Mineralogy and Petrology from a British University, over five years field and executive experience seeks research/exploration/teaching position. Available April '58, now in Pakistan.

BOX 392. GEOLOGIST, BA, married, 3½ years mapping, aerial and detailed, metallic and non-metallic mineral evaluations. Photogeology, some geophysics, report writing.

BOX 393. PETROLEUM GEOLOGIST with geophysical background. M.Sc., Ph.D.; 12½ years with major company, 2 years with independent. Experienced in widely separated petroleum provinces. Capable of planning perceptive and aggressive exploration program. Interested mainly in the great potential of the Rocky Mt. province but will consider other areas. Administrative and executive abilities; will carry out land acquisitions and arrange drilling deals. References.

BOX 394. GEOLOGIST, 29, single, vet., B.S.—1957. Desires position in exploration, petroleum, or minerals, domestic or foreign.

BOX 395. GEOLOGIST, M.A., Ph.D. residence requirements completed, dissertation partially completed; field and teaching experience. Desires teaching position in either Mineralogy, Elementary Geology, Structural Geology or Geomorphology. Single, 26. Available September 1958.

BOX 396. METALS EXPLORATION GEOLOGIST, Ph.D., married. Desires field or research position with progressive company—foreign or domestic; salaried or consulting basis. Principal interest is in disseminated deposits, light metals, and sedimentary uranium. Well qualified in field and laboratory mineralogy. References furnished. Available 2 weeks notice.

RESOURCEFUL and industrious geologist (B.A. degree) desires per. pos. with good future in any geol. or related work. Married, 27, recent vet. Physical and Historical Geol. lab. instructor during senior yr. in coll. One yr. geol. and carto. exp. with U.S.G.S. while in army in Germany (field work, descriptions, evaluations, compilation, etc.). J. E. Tracy, 2319 Margaret St., Phila., Pa.

BOX 397. GEOLOGIST, 29, married, 6 years varied experience in all types of mineral deposits for USGS, state and private employers. Exploration main interest, desires western U.S. or possible foreign position. Excellent references. Presently employed, available on reasonable notice.

BOX 398. WHO NEEDS A 29 YEAR OLD, married exploration geologist with varied mineral deposit experience who can write? Has written articles and reports for all levels of geological interest and knowledge. Open to any attractive offer.

BOX 399. GEOLOGIST-GEOPHYSICIST specializing in water. 37, married. B.S., M.S., geology, credits for D.Sc.; physics minor, calculus, physical chemistry, engineering subjects. Returning from Turkey, Iran, Libya, Spain, Greece in charge of extensive U.S. military water supply programs. 5 years U.S.G.S. Proficient in electrical resistivity, magnetometer, seismograph, air photography-mapping, piloting, supervision, reports. Desire water exploration, exploitation, improvement, or research with industry, consultant, or public organization. Available January.

BOX 400. GEOLOGIST, Ph.D., 34 stratigraphy and sedimentary petrography, 4 years experience with U.S.G.S. Desires position in research or teaching. Available immediately.

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